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| Project Overview page 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Name of Project:** | | | Big as a Whale | | | | | | | | | | | | | | | | **Duration:** | | | 2 weeks | | | | | | |
| **Subject/Course:** | | | **Algebra 2** | | | | | | | **Teacher(s): Bond, Harris, Stugart, English 3 new hire, Green, Medley, Solomon** | | | | | | | | | **Grade Level:** | | | 11 | | | | | | |
| **Other Subject Areas to Be Included:** | | | Chemistry, English 3, Ecology, Art | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Project Idea**  Summary of the issue, challenge, investigation, scenario, or problem: | | | Research how size and food consumption differs among different types of whales. Physically measure the dimensions of the classroom and the average arm span of all students In the class. Use mathematical reasoning to determine how many whales of each type would fit in the classroom and how many students it would take to hug a whale. Perform calculations using scientific notation Create a scatter plot and use it to make predictions.  In English 3, students will read articles related to the whaling industry. Fill out a graphic organizer to organize a persuasive argument based on these readings. | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Essential Question** | | | How can I use the properties of real numbers to analyze and make predictions about something in the real world?  How do you defend cultural behavior that has negative environmental impacts? Examples: driving a large 8-cylinder car, hunting whales that are an endangered species, etc. | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Content Standards** to be taught and assessed**:** | | | Algebra 2:  SPI 3103.1.1 Move flexibly between multiple representations (contextual, physical, written, verbal, iconic/pictorial, graphical, tabular, and symbolic) of non-linear and transcendental functions to solve problems, to model mathematical ideas, and to communicate solution strategies.  SPI 3103.1.3 Use technology tools to identify and describe patterns in data using non-linear and transcendental functions that approximate data as well as using those functions to solve contextual problems.  SPI 3103.1.4 Use mathematical language, symbols, definitions, proofs and counterexamples correctly and precisely to effectively communicate reasoning in the process of solving problems via mathematical modeling with both linear and non-linear functions.  SPI 3103.2.2 Compute with all real and complex numbers.  SPI 3103.2.3 Use the number system, from real to complex, to solve equations and contextual problems.  SPI 3103.3.12 Interpret graphs that depict real-world phenomena.  SPI 3103.5.1 Compute, compare and explain summary statistics for distributions of data including measures of center and spread.  SPI 3103.5.3 Analyze patterns in a scatter-plot and describe relationships in both linear and non-linear data.  Chemistry: SPI Dimensional analysis and conversion of units  History:  English 3:  (reading op/ed pieces on the whaling industry and preparing for a debate using a graphic organizer)  CLE 3005.2.6 Deliver effective oral presentations.  CLE 3005.3.2 Employ various prewriting strategies.  CLE 3005.5.2 Analyze text for fact and opinion, cause-effect, inferences, evidence, and conclusions.  CLE 3005.5.3 Evaluate an argument, considering false premises, logical fallacies, and quality of evidence presented.  CLE 3005.5.4 Analyze the logical features of an argument.  Computer Applications: Professional skills  Library Media Specialist: web-based research skills  Ecology:  CLE 3255.2.1 Cite examples of populations limited by natural factors, humans or both.  CLE 3255.2.2 Explain population growth patterns and rates.  CLE 3255.2.3 Summarize how natural selection influences a population over time.  Art: | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | **T** | **A** | **E** |  | | | | | | | | | **T** | | **A** | | | **E** |
| **Professional (21st Century) Skills** to be taught, assessed and/or encouraged**:** | | | Collaboration | | | | | | | | X |  | X | Other: | | | | | | | | |  | |  | | |  |
| Communication (Oral Presentation) | | | | | | | | X |  | X |  | | | | | | | | |  | |  | | |  |
| Critical Thinking/Problem Solving | | | | | | | | X | X | X |  | | | | | | | | |  | |  | | |  |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Major Products & Performances** | Group: | | | * Poster showing human and whale dimensions drawn to scale (each class does 1/6 of the mural on the grafitti wall, but must have proportion correct before painting) | | | | | | | | | | | | | | | | **Presentation Audience**   **Presentation Audience:**      Class   School | | | | | | | | |
|  | Class X | | | | | | | |
|  | School X | | | | | | | |
|  | Community | | | | | | | |
| Individual: | | | * Debate organizer (English 3) * Project worksheets with results of data collection, scatter plot, and prediction (Algebra 2) | | | | | | | | | | | | | | | |  | Experts X | | | | | | | |
|  | Web | | | | | | | |
|  | Other: | | | | | | | |
| Project Overview page 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Entry Event** to  launch inquiry,  engage students: | | Show brief video clip of whaling (Teachertube - Greenpeace and Japanese whaling industry). Show pictures of a whale and have students guess how many people It would take to hug the whale. At end of project, students who were closest to the correct answer win a prize. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Assessments** | | **Formative Assessments**  (During Project) | | | | X | | Quizzes/Tests | | | | | | | |  | | Practice Presentations | | | | | |  | | |
| X | | Journal/Learning Log | | | | | | | |  | | Notes | | | | | |  | | |
| X | | Preliminary Plans/Outlines/Prototypes | | | | | | | |  | | Checklists | | | | | |  | | |
|  | | Rough Drafts | | | | | | | |  | | Concept Maps | | | | | |  | | |
|  | | Online Tests/Exams | | | | | | | |  | | Other: | | | | | |  | | |
| **Summative Assessments**  (End of Project) | | | |  | | Written Product(s), with rubric:  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | | | | X | | Other Product(s) or Performance(s), with  rubric:\_Poster\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | | | |  | | |
|  | | Oral Presentation, with rubric | | | | | | | |  | | Peer Evaluation | | | | | |  | | |
| X | | Multiple Choice/Short Answer Test | | | | | | | |  | | Self-Evaluation | | | | | |  | | |
|  | | Essay Test | | | | | | | |  | | Other: | | | | | |  | | |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Resources Needed** | | **On-site people, facilities:** | | | | | | | STEM mural designers (contact Allison Vai) | | | | | | | | | | | | | | | | | | | |
| **Equipment:** | | | | | | | Laptop cart for research, yardsticks or tape measures, poster materials, paint, paint brushes, air brushes, laser measurement tool, 100-m tape measure | | | | | | | | | | | | | | | | | | | |
| **Materials:** | | | | | | | Copies of articles on whaling industry, copies of graphic organizers, copies of project worksheets | | | | | | | | | | | | | | | | | | | |
| **Community resources:** | | | | | | | Professional Surveyor to come as guest speaker | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Reflection Methods** | | **(Individual, Group, and/or Whole Class)** | | | X | | Journal/Learning Log | | | | | | | |  | | Focus Group | | | | | |  | | |  | | |
| X | | Whole-Class Discussion | | | | | | | |  | | Fishbowl Discussion | | | | | |  | | |  | | |
|  | | Survey | | | | | | | |  | | Other: | | | | | |  | | |  | | |